

GROSS ALPHA AND BETA ACTIVITY ANALYSIS USING LIQUID SCINTILLATION TECHNIQUE IN MINERAL WATERS IN THE NORTH OF IRAN

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A project to characterize the Gross-alpha and beta activities in order to checking compliance to derived limit values in mineral spring waters in the vicinity of Rasht city, north of Iran has been completed. Gross alpha and beta activities were determined by direct measurement of water samples using α/β discrimination liquid scintillation counting (LSC) which provide simultaneous alpha and beta measurement. In this study, an Ultra-low background Wallac-Quantulus 1220 LSC system with α/β discrimination, the Optiphase Hisafe 3 cocktail and 20 ml Polyethylene vials were applied. The α/β discrimination parameter was optimized based on pulse shape analysis (PSA). The results show that the gross beta activity in all cases is lower than the maximum contaminant level (MCL) and the gross alpha activity is higher in some samples collected near Rasht City. Further investigations demonstrated that in cases with high gross alpha content the major contribution of the radioactivity content is due to uranium. Such measurements add useful information for the appropriate management of water supplies that are socially and economically very important to the health of residents living in the north of Iran.